

Uplan

Bài này là bài [V11PLAN](#) với giới hạn N lớn hơn.

Note: this is V11PLAN with higher limit for N.

In 2011, Vietnam sets out a national development plan. The plan will consist of two phases: the first half of the year and the second half of the year. At each phase, a number of paths between some pairs of cities will be built.

You are given a graph describe the result of the plan, in which each edge (i,j) represents the plan to make city i and city j connected (not necessarily directly). You need to count the number of different plans that can produce that graph. Two plans are different if there is a road being built in a phase of the plan but not built in the corresponding phase of the other plan.

For example, if we build in the first phase road $(1,2)$, and then in the second phase we build $(2,3)$, the resulting graph will have three edges: $(1,2)$, $(2,3)$, $(1,3)$. Building $(1,2)$ in the first phase and $(1,2)$, $(1,3)$ in the later phase produce the same result. Note, we can only build a road between a pair of cities in a phase, but at the later phase we can rebuild that route again due to subsidence rate in Vietnam is pretty fast.

Input

The first line is N ($1 \leq N \leq 80$).

N lines follow, each has N integers. City i and j should be connected at the end of the year if the j -th number at line i is 1, else it's 0. The input will make sure that if city i and j are connected, j and k are connected, then i and k are connected.

Output

A single integer which is the number of different plans modulo 1000000007.

Example

Input:

```
2
0 1
1 0
```

Output:

```
3
```

Explain: we can build the road between two cities only in the first haft of the year, second half of the year, or both.

Input:

```
3
0 1 1
1 0 1
1 1 0
```

Output:

Input:

16

```
0111111111111111
1011111111111111
1101111111111111
1110111111111111
1111011111111111
1111101111111111
1111110111111111
1111111011111111
1111111101111111
1111111110111111
1111111111011111
1111111111101111
1111111111110111
1111111111111011
1111111111111101
1111111111111110
```

Output:

604876153